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Mark T. Swihart

Curriculum Vitae

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EDUCATION AND EMPLOYMENT

University at Buffalo, State University of New York, Buffalo, NY

SUNY Distinguished Professor, November 2021-present

Department Chair, Chemical and Biological Engineering, 2018-present

Executive Director, New York State Center of Excellence in Materials Informatics, 2015-2018

UB Distinguished Professor, September 2014-November 2021

Co-Director, New York State Center of Excellence in Materials Informatics, 2012-2015

Director, UB2020 Strategic Strength in Integrated Nanostructured Systems, 2007-2015

Professor, Chemical and Biological Engineering, August 2008-August 2014

Associate Professor, Chemical and Biological Engineering, August 2004-August 2008

Assistant Professor, Chemical and Biological Engineering, August 1998-August 2004

Research Topics: Synthesis and applications of nanomaterials; Applications of nanomaterials in catalysis, sensing, imaging, and environmental applications; Computational modeling of materials processing; Aerosol reactor engineering; Colloidal chemistry.

ProOsseous, LLC, Co-Founder, 2017-present

NanoHydroChem, LLC, Co-Founder, 2016-present

University of Minnesota, Minneapolis, MN

Post-Doctoral Research Associate, Mechanical Engineering, August 1997-August 1998

Research Topics: Experimental and modeling studies of particle nucleation, growth and transport in silicon CVD; Modeling of r.f. plasma CVD of oriented diamond films.

Advisors: Steven L. Girshick, Peter H. McMurry, Stephen A. Campbell

University of Minnesota, Minneapolis, MN

Ph.D., Chemical Engineering, July, 1997

Fields of Study: Reaction Engineering, Chemical Kinetics, Mathematical Modeling, Reactive Flows, Chemical Vapor Deposition Processing.

Advisor: Robert W. Carr

Dissertation Title: Gas Phase Chemical Kinetics and the Detailed Modeling of Chemical Vapor Deposition Processes

Rice University, Houston, TX

B.S., Chemical Engineering, *Summa cum Laude*, May, 1992

HONORS AND AWARDS

Shell Thomas Baron Award in Fluid-Particle Systems (2023) from the Particle Technology Forum of the American Institute of Chemical Engineers.

Fellow of the American Institute of Chemical Engineers (2019).

Fellow of the American Association for the Advancement of Science (2015).

President Emeritus and Mrs. Meyerson Award for Distinguished Undergraduate Teaching and Mentoring, University at Buffalo (SUNY), 2015.

The Jacob F. Schoellkopf Medal of the Western New York section of the American Chemical Society, 2013.

Department of Chemical and Biological Engineering Outstanding Professor Award, 2004, 2008, 2011, 2012, and 2014, determined by nomination and vote of undergraduates in the department.

Sustained Achievement Award for research excellence, The University at Buffalo (SUNY), 2010.

Kenneth T. Whitby Award from the American Association for Aerosol Research, 2007. This award is presented to one individual annually and "recognizes outstanding technical contributions to aerosol science and technology by a young scientist".

Summer Research Scholar Faculty Mentor Award from the University at Buffalo Collegiate Science and Technology Entry Program and Louis Stokes Alliance for Minority Participation Program, 2007, 2012.

Outstanding McNair Faculty Mentor from the University at Buffalo Ronald E. McNair Post-Baccalaureate Achievement Program, 2006.

Licensed Innovation Award from the Research Foundation of SUNY, 2005.

J.B. Wagner Young Investigator Award of the High Temperature Materials Division of the Electrochemical Society, 2003. This is an international award presented to only one person every two years.

Promising Inventor Award from the Research Foundation of SUNY, 2003.

Doctoral Dissertation Fellowship, University of Minnesota, 1995-96

National Science Foundation Fellowship, 1992-95

PUBLICATIONS

Publication Statistics:

Over 300 refereed journal publications, over 70 invited lectures, three edited proceedings volumes, one textbook, five issued U.S. patents

Google Scholar: >25,400 citations, h-index = 83
(https://scholar.google.com/citations?user=d71rLx4AAAAJ&hl=en)

ISI/Web of Science: >19,900 citations, h-index = 75
(https://www.webofscience.com/wos/author/record/1113643)

I. Textbook

1) Smith, J.M., H.C. van Ness, M.M. Abbott, and M.T. Swihart, Introduction to Chemical Engineering Thermodynamics, McGraw-Hill Education, Dubuque, Iowa, USA, 8th edition (2017), 9th edition (2022 copyright, available March 23, 2021).

II. Publications in Refereed Journals:

** indicates corresponding author(s)*

1) Vishnoi, P., M.E. Tobias, M.T. Swihart, and M.T. Ehrensberger, "*In vitro* and *in silico* evaluation of hydrogen embrittlement of cathodically stimulated titanium", *Materials Today Communications*, in press, published online (2024). DOI: 10.1016/j.mtcomm.2024.109636

2) Kumar, A., Y. Zhao, S. Mohsenifard, V. Maheshkar, T.G. Thundat, and M.T. Swihart, "Platinum Decorated Palladium Nanowires for Room Temperature Hydrogen Detection", *Advanced Sensor Research*, *in press*, published online (2024). DOI: 10.1002/adsr.202400013

3) Chen, M.-Y., T.-S. Zhang, Z. Yan, J.-N. Lv, X.-T. Sun, R.-X. Yang, M.T. Swihart, X.-H. Xu, and Y. Liu, "Regioselective cation exchange reaction for photoelectrochemical water splitting", *Rare Metals*, **43**, 3400–3407 (2024).

4) Asatryan, R.*, J. Hudzik, and M.T. Swihart*, "Intramolecular Catalytic Hydrogen Atom Transfer (CHAT)", *Journal of Physical Chemistry A*, **128**, 2169-2190 (2024).

5) Liu, S., C. Dun*, Q. Jiang, Z. Xuan, F. Yang, J. Gao, J.J. Urban*, and M.T. Swihart*, "Challenging thermodynamics: combining immiscible elements in a single-phase nano-ceramic", *Nature Communications*, **15**, 1167 (2024).

6) Joseph, J.P., T. Malone, S.R. Abraham, A. Dutta, S. Gupta, A. Kuzmin, A. Baev, M.T. Swihart, J.R. Hendrickson*, and P.N. Prasad*, "Plasticizer induced Enhancement of Mesoscale Dissymmetry in Thin Films of Chiral Polymers with Variable Chain Length", *Advanced Materials*, **36**, 2305684 (2024).

7) Amiri, V., R. Asatryan, and M.T. Swihart*, "Automated Generation of a Compact Chemical Kinetic Model for *n*-Pentane Combustion", *ACS Omega*, **8**, 49098–49114 (2023).

8) Ponnada, S., D.B Gorle, I. Kumari, S.M.S. Kumar, M.T. Swihart, G.G. Botte*, and R.K. Sharma*, "Paradigm in single-atom electrocatalysts for dinitrogen reduction to ammonia", *Materials Chemistry Frontiers*, **7**, 6427-6445 (2023).

9) Hu, L., K. Chen, W.I. Lee, K. Kisslinger, C. Rumsey, S. Fan, V.T. Bui, N. Esmaeili, T. Tran, Y. Ding, M. Trebbin, C.-Y. Nam, M.T. Swihart*, and H. Lin, "Palladium-Percolated Networks Enabled by Low Loadings of Branched Nanorods for Enhanced H_2 Separations", *Advanced Materials*, **35** 2301007 (2023).

10) Singh*, S., I.S. Saggu, S. Singh, N. Kumar, K. Chen, Z. Xuan, R. Gupta, M.T. Swihart*, and S. Sharma*, "Detection of DMF and NH_3 at Room Temperature Using a Sensor Based on a MoS_2/Single-Walled Carbon Nanotube Composite", *ACS Applied Nano Materials*, **6**, 10698–10712 (2023).

11) Malekzadeh, M., V.V. Mane, Z. Xuan, T.Y. Ohulchanskyy, and M.T. Swihart*, "Laser Pyrolysis Synthesis of Upconverting Lanthanide-Doped $NaYF_4$ Nanocrystals for Anticounterfeiting Applications", *ACS Applied Nano Materials*, **6**, 3704–3717 (2023).

12) Joshi, B., E. Samuel, Y.I. Kim, H.S. Lee*, M.T. Swihart*, S.S. Yoon*, "Exploring the potential of MIL-derived nanocomposites to enhance performance of lithium-ion batteries", *Chemical Engineering Journal*, **461**, 141961 (2023).

13) Kumar, A., K. Chen, T. Thundat, and M.T. Swihart, "Paper-Based Hydrogen Sensors Using Ultrathin Palladium Nanowires", *ACS Applied Materials and Interfaces*, **15**, 5439-5448 (2023).

14) Qiao, L., Z. Fu, W. Zhao, Y. Cui, X. Xing, Y. Xie, J. Li, Y. Cheng, G.-H. Gao, Z. Xuan, Y. Liu, C. Lee, Y. Han, S. He*, M. Jones*, M.T. Swihart*, "Branching Phenomena in Nanostructure Synthesis Illuminated by the Study of Ni-Based Nanocomposites", *Chemical Science*, **14**, 1205 - 1217 (2023).

15) Saggu, I.S., S. Singh, K. Chen, Z. Xuan, M.T. Swihart*, and S. Sharma*, "Ultrasensitive Room-Temperature NO_2 Detection Using SnS_2/MWCNT Composites and Accelerated Recovery Kinetics by UV Activation", *ACS Sensors*, **8**, 243-253 (2023).

16) Liu, S., C. Dun, J. Wei, L. An, S. Ren, J.J. Urban, and M.T. Swihart*, "Creation of hollow silica-fiberglass soft ceramics for thermal insulation", *Chemical Engineering Journal*, **454**, 140134 (2023).

17) Alsharif, S.B., R. Wali, S.T. Vanyo, S. Andreana, K. Chen, B. Sheth, M.T. Swihart, R. Dziak, and M.B. Visser*, "Strontium-loaded hydrogel scaffolds to promote gingival fibroblast function", *Journal of Biomedical Materials Research Part A,* **11**, 6-143 (2023).

18) Joseph, J.P., S.R. Abraham, A. Dutta, A. Baev, M.T. Swihart, and P.N. Prasad*, "Modulating the Chiroptical Response of Chiral Polymers with Extended Conjugation

within the Structural Building Blocks", *Journal of Physical Chemistry Letters*, **13**, 9085-9095 (2022).

19) Hong, Y., X. Chen, Y. Zhang, Y. Zhu, J. Sun, M.T. Swihart, K. Tan*, and L. Dong, "One-pot hydrothermal synthesis of high quantum yield orange-emitting carbon quantum dots for sensitive detection of perfluorinated compounds", *New Journal of Chemistry*, **46**, 19658-19666 (2022).

20) Chen, B.B., M. Li Liu, H.Y. Zou, Y. Liu, Y.F. Li, M.T. Swihart, and C.Z. Huang, "In-Situ Imaging of Ion Motion in a Single Nanoparticle: Structural Transformations in Selenium Nanoparticles", *Angewandte Chemie*, **61**, e202210313 (2022).

21) S. Singh, I.S. Saggu, K. Chen, Z. Xuan, M.T. Swihart*, and S. Sharma*, "Humidity-Tolerant Room-Temperature Selective Dual Sensing and Discrimination of NH_3 and NO Using a WS_2/MWCNT Composite" *ACS Applied Materials and Interfaces*, **14**, 40382–40395 (2022).

22) Hu, L., S. Fan, L. Huang, V.T. Bui, T, Tran, K. Chen, Y. Ding, M.T. Swihart, and H. Lin*, Supramolecular Polymer Networks of Ion-Coordinated Polybenzimidazole with Simultaneously Improved H_2 Permeability and H_2/CO_2 Selectivity, *Macromolecules*, **55**, 6901-6910 (2022).

23) Liu, S., C. Dun, J. Chen, S. Rao, M. Shah, J. Wei, K. Chen, Z. Xuan, E.A. Kyriakidou, J.J. Urban, and M.T. Swihart*, "A General Route to Flame Aerosol Synthesis and in situ Functionalization of Mesoporous Silica", *Angewandte Chemie*, **61**, e202206870 (2022).

24) Liu, S., C. Dun, M. Shah, J. Chen, S. Rao, J. Wei, E.A. Kyriakidou, J.J. Urban, and M.T. Swihart*, "Producing ultrastable Ni-ZrO_2 nanoshell catalysts for dry reforming of methane by flame synthesis and Ni exsolution", *Chem Catalysis*, **2**, 2262-2274 (2022).

25) Kumar, A., Y. Zhao, S.R. Abraham, T. Thundat, M.T. Swihart*, "Pd Alloy Nanosheet Inks for Inkjet Printable H_2 Sensors on Paper", *Advanced Materials Interfaces*, **9**, 2200363 (2022).

26) Kumar, A., T. Thundat, and M.T, Swihart*, "Ultrathin Palladium Nanowires for Fast and Hysteresis-Free H_2 Sensing", *ACS Applied Nano Materials*, **5**, 5895–5905 (2022).

27) Sabatini, C.,* R.J. Aguilar, Z. Zhang, S. Makowka, A, Kumar. M.M. Jones, M.B. Visser. M. T. Swihart, and C. Cheng, "Mechanical characterization and adhesive properties of a dental adhesive modified with a polymer antibiotic conjugate", *Journal of the Mechanical Behavior of Biomedical Materials*, **129**, 105153 (2022).

28) Joshi, B., E. Samuel, Y.-I. Kim, A.L. Yarin*, M.T. Swihart*, and S.S. Yoon*, "Review of recent progress in electrospinning-derived freestanding and binder-free electrodes for supercapacitors", *Coordination Chemistry Reviews*, **460**, 214466 (2022).

29) Kumar, A., Y. Zhao, M.M. Mohammadi, J. Liu, T.G. Thundat, and M.T. Swihart*, "Palladium Nanosheet-Based Dual Gas Sensors for Sensitive Room-Temperature Hydrogen and Carbon Monoxide Detection", *ACS Sensors*, **7**, 225-234 (2022).

30) Joshi, B., E. Samuel, Y.-I. Kim, A.L. Yarin*, M.T. Swihart*, and S.S. Yoon*, "Progress and potential of electrospinning-derived substrate-free and binder-free lithium-ion battery electrodes", *Chemical Engineering Journal*, **430**, 132876 (2022).

31) Liu, S., M. Shah, S. Rao, L. An, M.M. Mohammmadi, A. Kumar, S. Ren, and M.T. Swihart*, "Flame aerosol synthesis of hollow alumina nanoshells for application in thermal insulation", *Chemical Engineering Journal*, **428**, 131273 (2022).

32) Wang, M., Y. Qin, W. Shao, Z.W. Cai, X. Zhao, Y. Hu, T. Zhang, S. Li, M.T. Swihart, Y. Liu*, and W. Wei*, "Surface-rare-earth-rich upconversion nanoparticles induced by heterovalent cation exchange with superior loading capacity", *Journal of Materials Science & Technology*, **97**, 223-228 (2022).

33) Djikaev*, Y., E. Ruckenstein, and M.T. Swihart*, "On the Fokker–Planck approximation in the kinetic equation of multicomponent classical nucleation theory", *Physica A: Statistical Mechanics and its Applications*, **585**, 126375 (2022).

34) Fan, M., Z. Xu, M. Liu, Y. Jiang, X. Zheng, C. Yang, W.C. Law, M. Ying, X. Wang, Y. Shao, M.T. Swihart, G. Xu, K.-T. Yong, and B.Z. Tang, "Recent advances of luminogens with aggregation-induced emission in multi-photon theranostics", *Applied Physics Reviews*, **8**, 041328 (2021).

35) Hughes, Z.E., M.A. Nguyen, Ji. Wang, Y. Liu, M.T. Swihart*, M. Poloczek, P.I. Frazier*, M.R. Knecht*, and T.R. Walsh, "Tuning Materials-Binding Peptide Sequences toward Gold- and Silver-Binding Selectivity with Bayesian Optimization", *ACS Nano*, **15**, 18260–18269 (2021).

36) Kumar, A., M.M. Mohammadi, Y. Zhao, Y. Liu, J. Liu, T. Thundat, and M.T. Swihart*, "Reduced Graphene Oxide-Wrapped Palladium Nanowires Coated with a Layer of Zeolitic Imidazolate Framework-8 for Hydrogen Sensing", *ACS Applied Nano Materials*, **4**, 8081-8092 (2021).

37) Zhu, L., L. Huang, S.R. Venna, A.K. Blevins, Y. Ding, D.P. Hopkinson, M.T. Swihart, and H. Lin*, "Scalable Polymeric Few-Nanometer Organosilica Membranes with Hydrothermal Stability for Selective Hydrogen Separation", *ACS Nano*, **15**, 12119-12128 (2021).

38) Fu, Z., L. Qiao, P. Li, X. Xuan, G. Gao, C. Li, Y. Liu, and M.T. Swihart*, "Magnetically Controllable Flowerlike, Polyhedral Ag–Cu–Co_3O_4 for Surface-Enhanced Raman Scattering", *ACS Applied Materials and Interfaces*, **13**, 57814-57821 (2021).

39) Clark, C.M., P. Vishnoi, M.T. Swihart, and M.T. Ehrensberger*, "The effect of cathodic voltage-controlled electrical stimulation of titanium on the surrounding microenvironment pH: An experimental and computational study", *Electrochmica Acta*, **393**, 138853 (2021).

40) Kumar, A., L. Huang, L. Hu, D. Yin, H. Lin*, and M.T. Swihart*, "Facile One-Pot Synthesis of PdM (M= Ag, Ni, Cu, Y) Nanowires for use in Mixed Matrix Membranes for

Efficient Hydrogen Separation", *Journal of Materials Chemistry A*, **9**, 12755 - 12762 (2021).

41) Malekzadeh, M., and M.T. Swihart*, "Vapor-Phase Production of Nanomaterials", *Chemical Society Reviews*, **50**, 7132-7249 (2021).

42) Mohammadi, M.M., C. Shah, S.K. Dhandapani, J. Chen, S.R. Abraham, W. Sullivan, R.D. Buchner, E.A. Kyriakidou, H. Lin, C.R.F. Lund, and M.T. Swihart*, "Single-Step Flame Aerosol Synthesis of Active and Stable Nanocatalysts for the Dry Reforming of Methane", *ACS Applied Materials and Interfaces*, **13**, 17618-176278 (2021).

43) Yin, D., C.C. Dun, H. Zhang, Z. Fu, X. Gao, X. Wang, D.J. Singh, D.L. Carroll*, Y. Liu*, and M.T. Swihart*, "Binary and Ternary Colloidal Cu-Sn-Te Nanocrystals for Thermoelectric Thin Films", *Small*, **17**, 2006729 (2021).

44) Yin, D., Q. Li, Y. Liu* and M.T. Swihart*, "Anion Exchange Induced Formation of Kesterite Copper Zinc Tin Sulphide-Copper Zinc Tin Selenide Nanoheterostructures", *Nanoscale*, **13**, 4828-4834 (2021).

45) Sharma, A., A. Kumar, C. Li, P. Panwar Hazari, S. Mahajan, R. Aalinkeel, R.K. Sharma*, and M.T. Swihart*, "A Cannabidiol loaded Mg–gallate Metal Organic Framework based Potential Therapeutic for Glioblastomas", *Journal of Materials Chemistry B*, **9**, 2505-2514 (2021).

46) Fu, Z., Z. Xuan, C. Li, L. Qiao, Y. Liu, and M.T. Swihart*, "Shape Control of Cu/ZnO Core–Shell Nanocubes and Related Structures for Localized Surface Plasmon Resonance", *ACS Applied Nano Materials*, **4**, 995-999 (2021).

47) Joshi, B., E. Samuel, Y.-I Kim, A.L. Yarin*, M.T. Swihart*, and S.S. Yoon*, "Electrostatically Sprayed Nanostructured Electrodes for Energy Conversion and Storage Devices", *Advanced Functional Materials*, **31**, 2008181 (2021).

48) Zhang, Z., M.M Jones, C. Sabatini, S.T. Vanyo, M. Yang, A. Kumar, Y. Jiang, M.T. Swihart, M.B. Visser*, and C. Cheng*, "Synthesis and Antibacterial Activity of Polymer-Antibiotic Conjugates Incorporated into a Resin-Based Dental Adhesive", *Biomaterials Science*, **9**, 2043-2052 (2021).

49) Kumar, A., A. Sharma, Y. Chen, M.M. Jones, S.T. Vanyo, C. Li, M.B. Visser, S.D. Mahajan, R.K. Sharma*, and M.T. Swihart*, "Copper@ ZIF 8 Core Shell Nanowires for Reusable Antimicrobial Face Masks", *Advanced Functional Materials*, **31**, 2008054 (2021).

50) Moussa, H., M.M. Jones, N. Huo, R. Zhang, M. Keskar, M.B. Visser, M.T. Swihart, C. Cheng, and C. Sabatini, "Biocompatibility, mechanical, and bonding properties of a dental adhesive modified with antibacterial monomer and cross-linker", *Clinical Oral Investigations*, **25**, 2877-2889 (2021).

51) Liu, S., M.M. Mohammadi, and M.T. Swihart*, "Fundamentals and Recent Applications of Catalyst Synthesis Using Flame Aerosol Technology", *Chemical Engineering Journal,* **405**, 126958 (2021).

52) Fu, Z., L. Qiao, Y. Liu, Z. Xuan, C. Li, C. Lee, and M.T. Swihart*, "A General Hierarchical Flower-Shape Cobalt Oxide Spinel Template and Derived Oxide Alloys: Facile Method, Morphology Control and Enhanced Saturation Magnetization", *Journal of Materials Chemistry C*, **8**, 14056 - 14065 (2020).

53) Sharma, A., A. Kumar, C. Li, R.K. Sharma, and M.T. Swihart*, "Microencapsulated UV filter@ ZIF-8 based sunscreens for broad spectrum UV protection", *RSC Advances*, **10**, 34254-34260 (2020).

54) Amiri Roodan, V., J. Gómez-Pastora, I.H. Karampelas, C. González-Fernández, E. Bringas, I. Ortiz, J.J. Chalmers, E.P. Furlani, and M.T. Swihart*, "Formation and manipulation of ferrofluid droplets with magnetic fields in a microdevice: a numerical parametric study", *Soft Matter*, **16**, 9506-9518 (2020).

55) Mohammadi, M.M., A. Kumar, J. Liu, Y. Liu, T. Thundat, and M.T. Swihart*, "Hydrogen Sensing at Room Temperature Using Flame-Synthesized Palladium-Decorated Crumpled Reduced Graphene Oxide Nanocomposites", *ACS Sensors*, **5**, 2344-2350 (2020).

56) Malekzadeh, M., P. Rohani, Y. Liu, A. Raszewski, F. Ghanei, and M.T. Swihart*, "Laser pyrolysis synthesis of zinc-containing nanomaterials using low-cost ultrasonic spray delivery of precursors", *Powder Technology*, **376**, 104-112 (2020).

57) Zhu, D., Y. Liu, M. Liu, X. Liu, P.N. Prasad, and M.T. Swihart*, "Galvanic replacement synthesis of multi-branched gold nanocrystals for photothermal cancer therapy", *Journal of Materials Chemistry B*, **8**, 5491-5499 (2020).

58) Chen, J., P. Rohani, S. Karakalos, M.J. Lance, T.J. Toops, M.T. Swihart, and E.A. Kyriakidou*, "Boron-hyperdoped silicon for the selective oxidative dehydrogenation of propane to propylene", *ChemComm*, **56** 9882-9885 (2020).

59) An, S, B Joshi, A.L. Yarin*, M.T. Swihart*, and S.S. Yoon*, "Supersonic Cold Spraying for Energy and Environmental Applications: One-Step Scalable Coating Technology for Advanced Micro- and Nanotextured Materials", *Advanced Materials*, **32**, 1905028 (2020).

60) Walker*, E.A., M. Mohammadi, M.T. Swihart, "Graph Theory Model of Dry Reforming of Methane on Rh (111)", *The Journal of Physical Chemistry Letters*, **11**, 4917-4922 (2020).

61) Kim, M.-W., B. Joshi, E. Samuel, H. Seok, A. Aldalbahi, M. Almoiqli, M.T. Swihart, and S.S. Yoon, "Electrosprayed MnO_2 on ZnO Nanorods with Atomic Layer Deposited TiO_2 Layer for Photoelectrocatalytic Water Splitting", *Applied Catalysis B: Environmental*, **271**, 118928 (2020).

62) Samuel, E., C.W. Park, T.G. Kim, B. Joshi, A. Aldalbhadi, H.S. Alanzi, M.T. Swihart, W.Y. Yoon*, S.S. Yoon*, "Dodecahedral ZnO/C framework on reduced graphene oxide

sheets for high-performance Li-ion battery anodes", *Journal of Alloys and Compounds*, **834**, 155208 (2020).

63) Samuel, E., B. Joshi, M.W. Kim, M.T. Swihart*, and S.S. Yoon*, "Morphology Engineering for Efficient Photoelectrochemical Water Splitting", *Nano Energy*, **72**, 104648 (2020).

64) Kim, T.G., E. Samuel, C.-W. Park, B. Joshi, M.-W. Kim, M.T. Swihart, and S.S. Yoon*, "Supersonically sprayed Zn_2SnO_4/SnO_2/carbon nanotube films for high-efficiency water splitting photoanodes", *Journal of Alloys and Compounds*, **828**, 154374 (2020).

65) Omidvar, M., H. Nguyen, L. Huang, C.M. Doherty, A.J. Hill, C.M. Stafford, X. Feng, M.T. Swihart, and H. Lin*, "Unexpectedly Strong Size-Sieving Ability in Carbonized Polybenzimidazole for Membrane H_2/CO_2 Separation", *ACS Applied Materials and Interfaces*, **11**, 47365-47372 (2019).

66) Mohammadi, M.M., S. Shao, S.S. Gunturi, A.R. Raghavan, N. Alexander, Y. Liu, C.M. Stafford, R.D. Buchner and M.T. Swihart*, "A general approach to multicomponent metal-decorated crumpled reduced graphene oxide nanocomposites using a flame-based process", *Nanoscale*, **11**, 19571-19578 (2019).

67) Liu, M., Y. Liu, B. Gu*, X.B. Wei, G.X. Xu*, X.M. Wang*, M.T. Swihart*, and K.-T. Yong*, "Recent advances in copper sulphide-based nanoheterostructures", *Chemical Society Reviews*, **48**, 4950-4965 (2019).

68) Kabashin*, A.V., A. Singh, M.T. Swihart*, I.N. Zavestovskaya, and P.N. Prasad*, "Laser Processed Nanosilicon: A Multifunctional Nanomaterial for Energy and Health Care", *ACS Nano*, **13**, 9841-9867 (2019).

69) Kumar, A., M.M. Mohammadi, and M.T. Swihart*, "Synthesis, growth mechanisms, and applications of palladium-based nanowires and other one-dimensional nanostructures", *Nanoscale*, **11**, 19058-19085 (2019).

70) Samuel, E., T.-G. Kim, C.-W. Park, B. Joshi, M.T. Swihart, and S.S. Yoon*, "Supersonically Sprayed Zn_2SnO_4/SnO_2/CNT Nanocomposites for High-Performance Supercapacitor Electrodes", *ACS Sustainable Chemistry & Engineering*, **7**, 14031-14040 (2019).

71) Wang, X. X., M.T. Swihart and G. Wu*, "Achievements, challenges and perspectives on cathode catalysts in proton exchange membrane fuel cells for transportation", *Nature Catalysis*, **2**, 578–589 (2019).

72) Liu, Y, C.-K. Lim, Z. Fu, D. Yin, and M.T. Swihart*, "Can the Morphology of Biconcave Metal Sulfide Nanoplatelets be Preserved during Cation Exchange?", *Chemistry of Materials*, **31**, 5706-5712 (2019).

73) Zhu, L., D. Yin, Y. Qin, S. Konda, S. Zhang, A. Zhu, S. Liu, T. Xu, M.T. Swihart*, and H. Lin*, "Sorption Enhanced Mixed Matrix Membranes with Facilitated Hydrogen Transport

for Hydrogen Purification and CO_2 Capture", *Advanced Functional Materials*, **29**, 1904357 (2019).

74) Singh, A., B.K. Kim, Y. Mackeyev, P. Rohani, S.D. Mahajan, M.T. Swihart, S. Krishnan*, and P.N. Prasad*, "Boron-Nanoparticle-Loaded Folic-Acid-Functionalized Liposomes to Achieve Optimum Boron Concentration for Boron Neutron Capture Therapy of Cancer", *Journal of Biomedical Nanotechnology*, **15**, 1714-1723 (2019).

75) Kim, T.-G., B. Joshi, C.-W. Park, E. Samuel, M.-W. Kim, M.T. Swihart, and S.S. Yoon*, "Supersonically sprayed iron oxide nanoparticles with atomic-layer-deposited ZnO/TiO_2 layers for solar water splitting", *Journal of Alloys and Compounds*, **798**, 35-44 (2019).

76) Mohammadi, M.M., S.S. Gunturi, S. Shao, S. Konda, R.D. Buchner, and M.T. Swihart*, "Flame-synthesized nickel-silver nanoparticle inks provide high conductivity without sintering", *Chemical Engineering Journal*, **372**, 648-655 (2019).

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III. Publications in Conference Proceedings:

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IV. Book Chapters

1) Zheng Fu and Mark T. Swihart, "Functional Spinel Oxide Nanomaterials: Tailored Synthesis and Applications, Chapter 5 (pp.) in *Tailored Functional Oxide Nanomaterials: From Design to Multi-Purpose Applications*, edited by Chiara Maccato and Davide Barreca, Wiley, 2022.

2) Mohammad Malekzadeh, Parham Rohani, and Mark T. Swihart, "Laser Pyrolysis", Chapter 14 (pp. 161-168) in *Handbook of Laser Technology and Applications*, edited by Chunlei Guo and Subhash Singh, CRC Press, 2021.

3) Mark D. Allendorf, Theodore. M. Besmann, Robert J. Kee and Mark T. Swihart, "Modeling CVD Processes", Chapter 3 (pp. 93-157) in *Chemical Vapor Deposition: Precursors, Processes, and Applications,* edited by Anthony C. Jones and Michael L. Hitchman, Royal Society of Chemistry, 2009.

4) Mark T. Swihart, "Silicon Nanoparticles for Biophotonics", Chapter 4 in *Nanotechnology in Biology and Medicine: Methods, Devices, and Applications*, edited by Tuan Vo Dinh, CRC Press, 2007.

5) Mark T. Swihart, "Constructing Reaction Mechanisms", Chapter 5 in *Modelling of Chemical Reactions*, edited by Robert W. Carr, *Comprehensive Chemical Kinetics, vol. 42*, pp. 185-242, Elsevier, 2007.

V. Proceedings Volumes Edited

1) Swihart, M.T., D. Barreca, R.A. Adomaitis, and K. Wörhoff, Editors, "EuroCVD 17 / CVD 17" (Symposium held at the 2009 Fall ECS Meeting in Vienna, Austria), *ECS Transactions,* **25(8)**, 1324 pp. (2009).

2) Swihart, M. T., R. Schmid, C. Wolden, D.G. Goodwin, and M. Sugiyama Editors. **"***Fundamental Gas-Phase and Surface Chemistry of Vapor-Phase Materials Processing 3"***,** (Symposium held at the 2006 Spring ECS Meeting in Denver, CO.) *ECS Transactions,* **2(7)**, 290 pp. (2007).

3) Swihart, M. T.; Allendorf, M. D.; Meyyappan, M.; Editors. **"***Fundamental Gas-Phase and Surface Chemistry of Vapor-Phase Deposition II and Process Control, Diagnostics, and Modeling in Semiconductor Manufacturing IV" Proceedings of the Electrochemical Society,* **2001-13**, 508 pp. (2001).

VI. Invited Presentations

1) Swihart, M.T., "Colloidal and Aerosol Synthesis of Novel Nanomaterials for Energy, Environment, and Human Health", Particle Technology Forum Awards Session, AIChE Annual Meeting, Orlando, Florida, November 8, 2023.

2) Swihart, M.T., "Colloidal and Aerosol Synthesis of Novel Nanomaterials for Energy, Environment, and Human Health", School of Sustainable Chemical, Biological, and Materials Engineering, University of Oklahoma, September 19, 2023.

3) Swihart, M.T., "Colloidal and Aerosol Synthesis of Novel Nanomaterials for Energy, Environment, and Human Health", Department of Chemical Engineering, Northeastern University, September 20, 2023.

4) Swihart, M.T., "A flame-based aerosol approach to inorganic nanomaterials of tailored composition for energy applications", Workshop on New Opportunities in Chemistry & Materials Sciences w/Anomalous X-ray Scattering, Argonne National Laboratory, May 3, 2023.

5) Swihart, M.T., "Colloidal and Aerosol Synthesis of Novel Nanomaterials for Energy, Environment, and Human Health", Keynote Lecture, International Conference on Smart Materials Perspectives and Prospective (SMPP-2023), University of Delhi, New Delhi, India, March 28, 2023.

6) Swihart, M.T., "Flame Aerosol Synthesis of High-entropy Ceramic Nanoparticles", virtual presentation for The Molecular Foundry Seminar Series, Lawrence Berkeley National Laboratory, September 27, 2022.

7) Swihart, M.T., "Aerosol synthesis of nanomaterials for photonics by laser pyrolysis", SPIE Photonics West Online, February 2022 (recorded).

8) Swihart, M.T., "Flame-based Aerosol Synthesis of Metal Nanoparticles and Supported-Metal Nanostructures", Department of Energy, Environmental, and Chemical Engineering, Washington University in St. Louis, November 19, 2021.

9) Swihart, M.T., "Flame-based Aerosol Synthesis of Metal Nanoparticles and Supported-Metal Nanostructures", TechConnect World Innovation Conference, Washington, D.C., October 2021.

10) Swihart, M.T., "Nanomedicine: Advances, Opportunities, and Challenges", Invited webinar with nearly 200 registrants, organized by the student-led Chemistry Society of Sri Venkateswara College, University of Delhi, India, April 20, 2021.

11) Swihart, M.T., "Comparing and Contrasting Aerosol and Colloidal Routes to Inorganic Nanomaterials", Química en tu Mundo 8vo (8th International Congress on Chemistry in Our World), Universidad Autónoma de Baja California, February 24, 2020. One of two plenary speakers; the other was Nobel Prize winner Robert Grubbs.

12) Swihart, M.T., "Flame-based Aerosol Synthesis of Metal Nanoparticles and Supported-Metal Nanostructures & Solution-Phase Synthesis of Transition-Metal Chalcogenide Nanostructures", University of New Mexico, February 5, 2020.

13) Swihart, M.T., "Some Studies of Synthesis and Applications of Silicon Nanoparticles", IFE Institute for Energy Technology, Oslo, Norway, November 21, 2019.

14) Mohammad Moein Mohammadi, Naveshkaanth Alexander, Anirudh Raghavan, William Sullivan, Raymond Buchner, Haiqing Lin, Carl R. F. Lund, and Mark T. Swihart, "Catalyst Design and Production for Methane Dry Reforming Using a Flame-Driven High Temperature Reducing Jet Aerosol Reactor", Session in Honor of the Wilhelm Award Recipient, AIChE Annual Conference, November 11, 2019.

15) Swihart, M.T., "Flame-based Aerosol Synthesis of Metal Nanoparticles and Supported-Metal Nanostructures", Chemistry Department, Indiana University, Bloomington, IN, March 19, 2019.

16) Swihart, M.T., "Laser- and Flame-based Synthesis of Non-Oxide Nanoparticles", 1st Symposium on Nonequilibrium Multiphase Systems", Washington University in St. Louis, Dec. 7, 2018.

17) Swihart, M.T., "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", Beijing University of Technology, April 25, 2018.

18) Swihart, M.T., "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", Beijing University of Chemical Technology, April 24, 2018.

19) Swihart, M.T., "Synthesis and Potential Biomedical Applications of Plasmonic Semiconductor Nanostructures", Shenzhen University, China, April 20, 2018.

20) Liu, Y., L. Qiao, and M.T. Swihart, "Recent Progress in Solution-Phase Synthesis of Magnetic Metal Oxide and Plasmonic Semiconductor Nanocrystals", Research Institute of Materials Science, Shanxi Normal University, Linfen, China, April 14, 2018.

21) Swihart, M.T., "Opportunities and Challenges in Using Photoluminescent Silicon Quantum Dots for Bioimaging", Pittcon 2018, Orlando, Florida, February 28, 2018.

22) Swihart, M.T., "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, November 17, 2017.

23) Swihart, M.T., "Recent Advances in the Synthesis, Interconversion, and Applications of Plasmonic Semiconductor Nanoparticles", Keynote Lecture, 10th International Conference on Nanophotonics, Recife, Brazil, July 3, 2017.

24) Swihart, M.T., "Synthesis and Potential Biomedical Applications of Plasmonic Semiconductor Nanostructures", College of Pharmaceutical Sciences, Southwest University, Chonqing, China, February 21, 2017.

25) Swihart, M.T., "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", College of Chemistry and Chemical Engineering, Southwest University, Chonqing, China, February 20, 2017.

26) Swihart, M.T., S. Konda, and P. Rohani, "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", MRS Fall Meeting, Boston, Massachusetts, Nov. 29, 2016.

27) Swihart, M.T., S. Konda, and P. Rohani, "Aerosol Synthesis of Nanomaterials for Hydrogen Generation and Purification Applications", IEEE San Francisco Bay Area Nanotechnology Council, Fall Symposium: Nanotechnology for Energy, Healthcare, and the Environment, Santa Clara, California, November 15, 2016.

28) Swihart, M.T., "Synthesis of New Nanomaterials for Diverse Energy Applications", Ningxia Normal University, Guyuan, China, June 12, 2016.

29) Swihart, M.T., "Synthesis of New Nanomaterials for Diverse Energy Applications", Shanxi Normal University, Linfen, China, June 7, 2016.

30) Swihart, M.T., "Synthesis and Potential Biomedical Applications of Plasmonic Semiconductor Nanostructures", PLA 301 General Hospital, Beijing, China, June 6, 2016.

31) Swihart, M.T., "Synthesis and Potential Biomedical Applications of Plasmonic Semiconductor Nanostructures", Shenzhen University, June 2, 2016.

32) Swihart, M.T. and Ulbrich, M.T., "How Collaborations among the State, Academia, and Industry are Creating Technology Solutions and Driving an Innovative Economy", Association of University Research Parks 2015 Conference, Buffalo, New York, October 1, 2015.

33) Swihart, M.T., “Introduction to UB and New York State Center of Excellence in Materials Informatics Research Capabilities”, June 29, 2015, and “Better Living through Nanomaterials”, June 30, 2015, Hainan University, Hainan, China.

34) Swihart, M.T., “Plasmonic Copper Chalcogenide-based Colloidal Nanocrystals with Tunable Size, Shape, Composition, and Optical Properties”, The 8th International Conference on Nanophotonics (keynote lecture), Changchun, China, May 27, 2015.

35) Swihart, M.T., “Plasmonic Copper Chalcogenide-based Colloidal Nanocrystals with Tunable Size, Shape, Composition, and Optical Properties”, Shenzhen University, Shenzhen, China, May 21, 2015.

36) Swihart, M.T., “Better Living through Nanotechnology”, UB Insights Program, April 14, 2015.

37) Swihart, M.T., “Synthesis and Potential Applications of Metal and Semiconductor Nanoparticles”, Flexible Electronics Workshop, Stony Brook University, August 21, 2014.

38) Swihart, M.T., “Semiconductor Nanocrystals Based on Non-Toxic Earth-Abundant Elements for Optoelectronics”, Key Laboratory of Magnetic Molecules and Magnetic Information Materials, Shanxi Normal University (山西师范大学), Linfen, China, July 1, 2014.

39) Swihart, M.T., “Semiconductor Nanocrystals Based on Non-Toxic Earth-Abundant Elements for Optoelectronics”, National Laboratory of Solid State Microstructures, Nanjing University (**南大**), Nanjing, China, June 28, 2014.

40) Swihart, M.T., “Synthesis and Potential Applications of Metal and Semiconductor Nanoparticles”, and “Semiconductor Nanocrystals Based on Non-Toxic Earth-Abundant Elements for Optoelectronics”, Nanjing University of Science and Technology (南京理工大学), Nanjing, China, June 27, 2014.

41) Swihart, M.T., “Aerosol Synthesis and Potential Applications of Metal and Semiconductor Nanoparticles”, Washington University in St. Louis, January 17, 2014.

42) Swihart, M.T., “The Production and Use of Semiconductor Nanocrystals for Optical Bioimaging”, The 15th Beijing Conference and Exhibition on Instrumental Analysis, Beijing, China, October 24, 2013.

43) Swihart, M.T., “The Production and Use of Semiconductor Nanocrystals for Optical Bioimaging”, Southwest University, Chongqing, China, October 22, 2013.

44) Liu, X., X. Wang, T. Lin, Y. Li, C. Li, B. Zhou, A.N. Cartwright, and M.T. Swihart, “Semiconductor Nanocrystals Based on Non-Toxic Earth-Abundant Elements for Optoelectronics”, Peking University, Beijing, China, September 27, 2013.

45) Liu, X., X. Wang, T. Lin, Y. Li, C. Li, B. Zhou, A.N. Cartwright, and M.T. Swihart, “Semiconductor Nanocrystals Based on Non-Toxic Earth-Abundant Elements for

Optoelectronics", International Union of Materials Research Societies (IUMRS) International Conference on Advanced Materials, Qingdao, China, September 24, 2013.

46) Sharma, M.K., W.J. Scharmach, R.D. Buchner, D. Qi, V. Papavassiliou, and M.T. Swihart, "Scalable Flame-Based Synthesis of Multicomponent Metal Nanoparticles", 9th World Congress of Chemical Engineering, Seoul, Korea, August 21, 2013.

47) Swihart, M.T., "Synthesis and Surface Modification of Nanocrystals of Silicon and other Earth-Abundant Semiconductors for Photovoltaics", Ulsan National Institute of Science and Technology, Ulsan, Korea, January 9, 2012.

48) Swihart, M.T., "Colloids of luminescent silicon nanocrystals: Synthesis, functionalization, and applications in bioimaging", Symposium in Honor of Eli Ruckenstein at 86: Colloid and Surface Chemistry: Looking Back and Looking Forward, American Chemical Society National Meeting, Denver, Colorado, August 28, 2011.

49) Swihart, M.T., "Luminescent Silicon Nanocrystals: Synthesis, Functionalization, and Applications", Photovoltaics Research Center, Korea Institute for Energy Research, Daejeon, Korea, August 24, 2010.

50) Swihart, M.T. "Luminescent Silicon Nanocrystals: Synthesis, Functionalization, and Applications in Bioimaging", Bonsai Project Symposium "Breakthroughs in Nanoparticles for Bio-Imaging", ENEA Research Center of Frascati, Frascati (Rome), Italy, April 9, 2010.

51) Swihart, M.T., F. Erogbogbo, C.A. Tien, S.J. Kim, and A.N. Cartwright, "Synthesis and Surface Modification of Silicon Nanocrystals for Photovoltaics", MRS 2010 Spring Meeting, San Francisco, California, April 6, 2010.

52) Swihart, M.T. "Luminescent Silicon Nanocrystals: Synthesis, Functionalization, and Applications", Department of Chemistry, Tulane University, March 8, 2010.

53) Swihart, M.T., "Synthesis of Metal and Semiconductor Nanoparticles in the Gas Phase", Particle Technology Laboratory, ETH (Swiss Federal Institute of Technology), Zurich, Switzerland, October 12, 2009.

54) Swihart, M.T., "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization, and Applications", Institute of Chemical Biology and State Key Laboratory for Agricultural Microbiology, Huazhong Agricultural University, Wuhan, China, June 26, 2009.

55) Swihart, M.T., "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization, and Applications", Department of Chemistry and Institute of Chemical Biology, Wuhan University, Wuhan, China, June 24, 2009.

56) Swihart, M.T., "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization, and Applications", Department Seminar Series, Chemical Engineering, The University of Massachusetts at Amherst, May 5, 2009.

57) Swihart, M.T., "Biocompatible silicon quantum dots for biophotonics", The Third iCeMS International Symposium: "MESO CONTROL of the cells, by the cells, for the cells", Kyoto, Japan, January 28, 2009.

58) Swihart, M.T., "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization, and Applications", 2nd International Workshop on Semiconductor Nanoparticles for Photovoltaics and Optoelectronics, Duisburg, Germany, December 11, 2008.

59) Swihart, M.T., "Nanoparticle Synthesis", Invited tutorial, American Association of Aerosol Research Annual Meeting, Orlando, Florida, October 20, 2008.

60) Swihart, M.T., and F. Erogbogbo, "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization, and Applications", 91st Canadian Chemistry Conference, Edmonton, Alberta, Canada, May 27, 2008.

61) Swihart, M.T., "Photoluminescent Silicon Nanocrystals: Aerosol Synthesis, Surface Functionalization and Applications", Dept. of Chemical and Biomolecular Engineering, The University of Maryland, Oct. 16, 2007.

62) Swihart, M.T., "Nanoparticle Synthesis in the Swihart Group at The University at Buffalo (SUNY)", General Meeting of the International Fine Particle Research Institute, June 28, 2006, Santa Barbara, California.

63) Swihart, M.T., "Better Living through Nanomaterials: Past, Present, and Future", UB Department of Electrical Engineering, January 27, 2006.

64) Swihart, M.T., "Preparation of Organically-Capped Silicon Quantum Dots", Brockhouse Institute for Materials Research, McMaster University, Ontario, Canada, November 14, 2005.

65) Swihart, M.T., "Vapor-Phase Synthesis of Nanoparticles", China/USA/Japan Joint Chemical Engineering Conference, Beijing, China, October 14, 2005.

66) Swihart, M.T., "Better Living through Nanomaterials: Past, Present, and Future", UB This Summer Lecture Series, June 16, 2005.

67) Swihart, M.T., "Production and Surface Functionalization of Macroscopic Quantities of Brightly Photoluminescent Silicon Nanoparticles and Magnetic Metal Nanoparticles", ECI Conference on "Nanoparticles from the Vapor Phase with Chemical and Biochemical Applications", Davos, Switzerland, August 10, 2004.

68) Li, X., Y. He, and M.T. Swihart, "Production and surface functionalization of macroscopic quantities of brightly photoluminescent silicon nanoparticles", University of Minnesota, IGERT program in nanoparticle technology, March 26, 2004.

69) Li, X., Y. He, and M.T. Swihart, "Production and surface functionalization of macroscopic quantities of brightly photoluminescent silicon nanoparticles", Dow Corning Corporation, Midland, MI, February 16, 2004.

70) Swihart, M.T., “J.B. Wagner Award Address: Assembling Gas-Phase Reaction Mechanisms for High Temperature Inorganic Systems Based on Quantum Chemistry Calculations and Reaction Rate Theories”, 204th meeting of the Electrochemical Society, October 14, 2003, Orlando, Florida.

71) Swihart, M.T., “High-Rate Synthesis and Characterization of Brightly Luminescent Silicon Nanoparticles with Applications in Hybrid Materials for Photonics and Biophotonics”, presented at a symposium entitled "Organic and Hybrid Materials for Nanophotonics" at the 48th Annual Meeting of the SPIE, August 4-5, 2003, San Diego, California.

72) Swihart, M.T., “Assembling Gas-Phase Reaction Mechanisms for High Temperature Inorganic Systems Based on Quantum Chemistry Calculations and Reaction Rate Theories”, presented as an *invited keynote lecture* at The IUPAC Conference on High Temperature Materials Chemistry – XI, May 19-23, 2003, Tokyo, Japan.

73) Swihart, M.T., “Preparing and Functionalizing Macroscopic Quantities of Brightly Photoluminescent Silicon Nanoparticles with Emission Spanning the Visible Spectrum”, May 20, 2003, Department of Chemical Systems Engineering, University of Tokyo.

74) Swihart, M.T., "High-Rate Synthesis, Characterization, and Potential Applications of Brightly Luminescent Silicon Nanoparticles", at the International Symposium on Structure and Dynamics of Heterogeneous Systems, Gerhard-Mercator-Universität Duisburg, November 29, 2002, Duisburg, Germany.

75) Swihart, M.T., “Experimental and Modeling Studies on the Nucleation and Growth of Silicon Nanoparticles from the Vapor Phase”, IT Collaboratory Teleconference Series, Held at University at Buffalo and broadcast to Rochester Institute of Technology and Alfred University, January, 2002.

76) Swihart, M.T., “Experimental and Modeling Studies on the Nucleation and Growth of Silicon Nanoparticles from the Vapor Phase”, Department of Electrical Engineering, University at Buffalo, April, 2002.

77) Swihart, M.T. "Chemical Kinetic Studies of the Homogeneous Chemical Nucleation of Silicon Nanoparticles", at a workshop entitled "Precursor materials, clusters and nanoparticles: Experiment and theory", Gerhard-Mercator-Universität Duisburg, October 5, 2000, Duisburg, Germany.

VI. Patents and Patent Applications

1) Zhu, L., L. Huang, M.T. Swihart, and H. Lin, “Organosilica Membranes, Methods of Making Same, and Uses Thereof”, pending application, PCT/US2021/014018, filed January 17, 2021.

2) Rohani, P., and M.T. Swihart, “Silicon-Carbon Nanomaterials, Method of Making Same, and Uses of Same”, pending application, PCT/US2019/18331, filed February 15, 2019. Licensed to NanoHydroChem, LLC.

3) Rohani, P., and M.T. Swihart, “Boron nanoparticle compositions and methods for making and using the same”, pending application PCT/US2016/055757, filed October 6, 2016. Optioned to NanoHydroChem, LLC.

4) Yong, K.-T., Y. Sahoo, M.T. Swihart, and P.N. Prasad, "Non-Spherical Semiconductor Nanocrystals and Methods of Making Them", U.S. Patent App. No. 20070186846A1, filed August 16, 2007. Licensed to Solexant Corporation.

5) Swihart, M.T., X. Li, and Y. He, "Production of nickel nanoparticles from a nickel precursor via laser pyrolysis", U.S. Patent App. No. 20060225534, filed October 12, 2006, licensed to INCO.

6) Ruckenstein, E., M.T. Swihart, and F. Hua, "Production of Photoluminescent Silicon Nanoparticles having Surfaces that are Essentially Free of Residual Oxygen", U.S. Patent No. 8,029,698 (2011).

7) Park, Y., R. Dziak, R. Genco, M.T. Swihart, and H. Periopanayagam, "Calcium Sulfate Based Nanoparticles", U.S. Patent No. 7,767,226 (2010). Optioned to ProOsseus, LLC.

8) Li, X., Y. He, and M.T. Swihart, "Process for Producing Luminescent Silicon Nanoparticles", U.S. Patent No. 7,371,666 (2008). Optioned to Innovalight, Inc.

9) Becker, C.L., J.R. Lattner, and M.T. Swihart, "Fluidized Bed Reactor and Process", U.S. Patent No. 6,627,068 (2003). Assigned to Exxon Chemical Company.

10) Becker, C.L., J.R. Lattner, and M.T. Swihart, "Fluidized Bed Reactor and Process for Producing 5-Ethylidene-2-Norbornene", U.S. Patent No. 6,294,707 (2001). Assigned to Exxon Chemical Company.

UNIVERSITY AND PROFESSIONAL SERVICE

I. Professional and Public Service

Editor, *Aerosol Science and Technology*, 2010-present.

Member of the Board of Consulting Editors, *AIChE Journal*, 2012-present.

Member of the Editorial Advisory Board of *Aerosol Science and Technology*, 2008-2010.

Member of the Editorial Advisory Board of the *International Journal of Chemical Kinetics*, 2001-2004.

Manuscript reviewer for *Nature, Science, Nature Nanotechnology, Nature Communications, Advanced Materials, Angewandte Chemie, Nano Letters, Advanced Functional Materials, Advanced Energy Materials, ACS Nano, Journal of the American Chemical Society, Chemical Society Reviews, Accounts of Chemical Research, Science Translational Medicine, Advanced Optical Materials, Scientific Reports, Chemistry of Materials, Small, Chemical Communications, Nanoscale, ACS Applied Materials & Interfaces, Langmuir, The Journal of Physical Chemistry (A, B, C, and Letters)*, *Journal of Materials Chemistry (A, B), Bioconjugate Chemistry, Applied Physics Letters, Industrial and Engineering Chemistry Research, AIChE Journal, Chemistry: An Asian Journal, Chemistry: A European Journal, The Journal of Chemical Physics, PhysChemChemPhys, RSC Advances, The Journal of the Electrochemical Society*, *Nanomedicine, The Journal of Materials Science, Sensors and Actuators B, Chemical Vapor Deposition, Nanotechnology, The International Journal of Chemical Kinetics, The Journal of Crystal Growth, Crystal Growth and Design,*

CrystEngComm, The Journal of Computational Chemistry, Journal of Biophotonics, Biophysical Journal, Journal de Physique IV, *The Journal of Aerosol Science*, *Analytical Chemistry, Aerosol Science and Technology, Materials Letters, The Journal of Nanoparticle Research, Surface Science, The Journal of Applied Physics, Applied Physics Letters, Nanoscale Research Letters, Physica E, Canadian Journal of Chemistry, Journal of Visualized Experiments, The Journal of Nanophotonics, Chemical Engineering Journal, The Journal of Thermal Spray Technology, The International Journal of Chemical Reaction Engineering, The Journal of Colloid and Interface Science, Colloids and Surfaces A, Materials, Colloids and Surfaces B, Applied Catalysis B, Optics Express, Plasma Chemistry and Plasma Processing, Ceramics International, Computational Materials Science,* and *Applied Physics A*.

Proposal reviewer/panelist for The U.S. National Science Foundation, the U.S. Department of Energy, the ACS Petroleum Research Fund, The Air Force Office of Scientific Research, The Swiss Federal Institute of Technology (ETH), the Dutch Technology Foundation (STW), AXA Research Fund, King Abdulaziz City for Science and Technology (KACST), National Science Center of Poland, and The U.S. Civilian Research and Development Foundation.

At-large member, Finance Committee, American Association for Aerosol Research, 2019-2022.

Conference Chair, 2016 Annual Meeting of the American Association for Aerosol Research, Portland, Oregon (4-year commitment from 2014 through 2017 meetings, in a series of roles ending with "past-chair").

Member of the Organizing Committee and Proceedings Editor for CVD-XVII/EUROCVD 17 held in October 2009 in Vienna Austria, in conjunction with the 216th meeting of the Electrochemical Society.

Lead organizer and proceedings editor for 'The Third International Symposium on Fundamental Gas-Phase and Surface Chemistry of Vapor-Phase Materials Processing', held at the 209th Meeting of The Electrochemical Society, May 2006, Denver, Colorado.

Member of the Organizing Committee for CVD-XVI/EUROCVD 14, held April 28-May 3, 2003 in Paris, France, in conjunction with the 203rd meeting of the Electrochemical Society.

Lead organizer and proceedings editor for 'The Second International Symposium on Fundamental Gas-Phase and Surface Chemistry of Vapor-Phase Materials Processing', held at the Electrochemical Society National Meeting, March 2001, Washington, D.C.

Member of the Executive Committee of the High Temperature Materials division of the Electrochemical Society, 1999-2013.

II. University Service

Member, Middle States working group for standard 6 (2022-present)

Member, Decanal review committee for the College of Arts and Sciences (2021-2022)

Member, Search Committee, Director of the UB Honors College (2021)

Member, Provost's Strategic Financial Management Advisory Group (2020-2021)

Member, UB-wide Student Retention Task Force (2019-2021)

Member, Vice Provost for Faculty Affairs' Chairs Advisory Committee (2019-present)

Department Chair, Chemical and Biological Engineering (2018-present)

Senator, UB Faculty Senate, (2015-2019)

Executive Director, New York State Center of Excellence in Materials Informatics (2015-2018)

Member, Faculty Senate Budget Priorities Committee (2015-present)

Co-Director, New York State Center of Excellence in Materials Informatics (2012-2015)

Director, UB2020 Strategic Strength in Integrated Nanostructured Systems (2007-2015)

Director of Graduate Studies for Chemical and Biological Engineering (2003-2007, 2011-2013)

Member of the A.A. Schomburg Fellowship selection committee (2006-2013)

Chair of Departmental Safety Committee (2001-2004)

Member of Departmental Undergraduate Studies Committee (2000-2003)

AIChE Student Chapter Advisor (1998-2005)

Freshman Engineering Mentor (1998-2009)

Freshman Honors Program Mentor (1998-present)

University Library Committee Representative (1998-2005)

Departmental Research Open House Organizing Committee (1998-2003)

Lead organizer of the "Workshop on Multifunctional Nanomaterials and Nanodevices" held May 18-19, 2007 at The University at Buffalo (SUNY).

Co-organizer of a workshop entitled "Nanotechnology for Detection and Manipulation of Single Molecules", held May 30, 2003 at UB

Deputy Director, Materials Division, The Institute for Lasers, Photonics, and Biophotonics (2002-present).

ORGANIZATIONAL MEMBERSHIPS

Fellow, The American Association for the Advancement of Science (AAAS), American Institute of Chemical Engineers (AIChE); Member, The Electrochemical Society (ECS), The American Chemical Society (ACS), The American Association for Aerosol Research (AAAR), The Materials Research Society (MRS), American Society for Engineering Education (ASEE), Tau Beta Pi, Phi Beta Kappa, and Sigma Xi

FORMAL TEACHING ACTIVITIES

Summer 2024:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 12 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. Offered the course fully online, with pre-recorded lectures and real-time/recorded daily sessions for Q&A and example problems.

Summer 2023:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 12 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. Offered the course fully online, with pre-recorded lectures and real-time/recorded daily sessions for Q&A and example problems.

Summer 2022:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 21 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. Offered the course fully online, with pre-recorded lectures and real-time/recorded daily sessions for Q&A and example problems.

Summer 2021:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 23 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. Offered the course fully online, with pre-recorded lectures and real-time/recorded daily sessions for Q&A and example problems.

Summer 2020:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 30 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. For the first time, offered the course fully online, with pre-recorded lectures and real-time/recorded daily sessions for Q&A and example problems.

Summer 2019:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 14 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics. For the first time, offered the course online both seated and online, producing video recordings of all lecture material and making WebEx connection available during scheduled class sessions.

Summer 2018:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 18 students).

Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics.

Fall 2017:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 37 students).

Taught this dual-listed undergraduate/graduate course for the seventh time.

Summer 2017:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 10 students).

- Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics.

Fall 2016:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 14 students).

Taught this dual-listed undergraduate/graduate course for the sixth time.

Summer 2016:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 28 students).

- Summer session offering of this required, core undergraduate course in chemical engineering thermodynamics.

Spring 2015:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 91 students).

- Had full responsibility for required, core undergraduate course in chemical engineering thermodynamics.

Fall 2014:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 28 students).

Taught this dual-listed undergraduate/graduate course for the fifth time.

Spring 2014:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 86 students).

Fall 2013:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 37 students).

- Taught this dual-listed undergraduate/graduate course for the fourth time.

Spring 2013:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 75 students).

- Had full responsibility for required, core undergraduate course in chemical engineering thermodynamics.

Fall 2012:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 16 students).

- Taught this dual-listed undergraduate/graduate course for the fourth time.

Spring 2012:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 72 students).

Co-Instructor, CE 407, Separation Processes, University at Buffalo, (3 credits, enrollment 65 students).

- Taught the second half of the course, covering batch distillation, liquid-liquid extraction, membrane separation, and related material.

Spring 2011:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 62 students).

Fall 2010:

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 20 students).

Spring 2010:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 55 students).

Fall 2009:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (5 credits, enrollment: 38 students).

- Had full responsibility for required, core graduate course in chemical kinetics and reaction engineering.

Spring 2009:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 47 students).

Fall 2008:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 22 students).

Spring 2008:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 47 students).

Fall 2007:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 27 students).

Spring 2007:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 35 students).

Fall 2006:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 20 students).

Spring 2006:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 44 students).

Spring 2005:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 46 students).

- Had full responsibility for required, core undergraduate course in chemical engineering thermodynamics.
- Introduced, in collaboration with David Kofke and staff from the Center for Technical Communications, a major technical writing assignment based on a 'virtual experiment' carried out using molecular simulations.

Instructor, CE 456/556, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 20 students).

- Taught this dual-listed undergraduate/graduate course for the second time. It was previously offered as CE412/512 (a special topics course number) as described below.

Fall 2004:

Advisor, CE 406 SWI, AIChE Student Chapter 'Chem-E-Car Competition', University at Buffalo, (3 credits, enrollment: 16 students).

Spring 2004:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 61 students).

- Had full responsibility for required, core undergraduate course in chemical engineering thermodynamics.
- Developed course web page including typed course notes, almost 200 additional pages of solved problems, and various other resources.
- Actively used the course web page and various computer demonstrations during lectures, which were given in a 'technology' classroom with computer projection facilities.

Instructor, CE 512, Chemically Reacting Flows, University at Buffalo, (3 credits, enrollment: 6 students).

- Developed an entirely new elective course at the advanced graduate level.

Fall 2003:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 18 students).

- Had full responsibility for required, core graduate course in chemical kinetics and reaction engineering.
- Developed (from 1998-2003) new course notes, incorporating microscopic views of kinetics and modern computer-based methods of analysis for both chemical kinetics and detailed modeling of complex reactors.
- Developed (from 1998-2003) course web page including over 300 typed pages of course notes, almost 200 additional pages of solved problems, and various other resources.
- Actively used the course web page and various computer demonstrations during lectures, which were given in a 'technology' classroom with computer projection facilities.

Advisor, CE 406 SWI, AIChE Student Chapter 'Chem-E-Car Competition, University at Buffalo, (3 credits, enrollment: 11 students).

Spring 2003:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 39 students).

Instructor, CE 412/512, Introduction to Aerosol Science and Technology, University at Buffalo, (3 credits, enrollment: 30 students).

- Developed an entirely new elective course at the senior undergraduate/first-year graduate level.

- Developed course web page including typed course notes, solved problems, and various other resources.

- Brought the entire class to my research laboratory for a demonstration of modern aerosol science instrumentation, and also gave several simpler in-class demonstrations.

Fall 2002:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 15 students).

Advisor, CE 406 SWI, AIChE Student Chapter 'Chem-E-Car Competition, University at Buffalo, (3 credits, enrollment: 7 students).

Spring 2002:

Instructor, CE 304, Chemical Engineering Thermodynamics, University at Buffalo, (4 credits, enrollment: 47 students).

Fall 2001:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 21 students).

Spring 2001:

Instructor, CE 328, Chemical Engineering Laboratory II, University at Buffalo, (1 credit, enrollment: 50 students).

- Re-structured laboratory experiments to include computer-aided data acquisition using graphical programming in the LabView data acquisition environment.

- Developed and applied a rubric-based assessment system for measuring student performance.

Fall 2000:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 10 students).

Spring 2000:

Instructor, CE 328, Chemical Engineering Laboratory II, University at Buffalo, (1 credit, enrollment: 38 students).

Advisor, CE 406 SWI, AIChE Student Chapter Team Competition, University at Buffalo, (3 credits, enrollment: 20 students).

Instructor, CE 502 SWI, Introduction to Matlab and Maple for Scientific Problem Solving, University at Buffalo, (1 credit, enrollment: 6 students).

Fall 1999:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 20 students).

Spring 1999:

Instructor, CE 328, Chemical Engineering Laboratory II, University at Buffalo, (1 credit, enrollment: 52 students).

Advisor, CE 406 SWI, AIChE Student Chapter Environmental Design Contest, University at Buffalo, (3 credits, enrollment: 13 students).

Instructor, CE 502 SWI, Introduction to Matlab and Maple for Scientific Problem Solving, University at Buffalo, (1 credit, enrollment: 7 students).

Fall 1998:

Instructor, CE 561, Applied Chemical Kinetics, University at Buffalo, (4 credits, enrollment: 22 students).

STUDENTS ADVISED

Summary: Advised 29 Ph.D. students to completion, with 10 current Ph.D. advisees. Advised 62 masters students to completion, with 4 current masters students. Advised over 110 undergraduate researchers.

Former Graduate Students:

Xuegeng Li, Ph.D. conferred February 2004. Currently at Shenzhen Technology University

Suddha Talukdar, Ph.D. conferred February 2004. Currently SOC Program Manager at Microsoft.

Yuanqing (Emily) He, Ph.D. conferred February 2006. Currently Senior Project Manager at Sabic Innovative Plastics.

Ken-Tye Yong, Ph.D. conferred September 2006. Currently Professor of Biomedical Engineering and Associate Dean for External Engagement, University of Sydney (Australia)

Weili Shi, Ph.D. conferred February 2007. Currently CEO at DK Electronic Materials, which he founded and which went public on the Shenzhen stock exchange in China. Current market cap is $800M.

Hongwang Zhang, Ph.D. conferred February 2008. Currently Senior Scientist at DK Electronic Materials

Hongyi Dang, Ph.D. conferred February 2009. Currently Principal Process Engineer at Technip, Houston, TX.

Folarin Erogbogbo, Ph.D. conferred June 2009, Currently Associate Professor of Biomedical Engineering at San Jose State University

William Scharmach, Ph.D. conferred June 2011. Currently Senior Development Specialist at Linde (formerly Praxair)

Sha Liu, Ph.D. conferred September 2011. Currently Application Engineer at KemPur

Munish Sharma, Ph.D. conferred September 2013. Currently at Honeywell UOP in Houston, Tx

Xin Liu, Ph.D. conferred February 2014, Currently R&D Chemist at Applied Materials

Xianliang Wang, Ph.D. conferred September 2015, Currently Director of Technology, ATVenture Center

Yue Li, Ph.D. conferred February 2016, Currently at Zhejiang University

Dewei Zhu, Ph.D. conferred June 2016, Currently at JutuChemTech, Ltd.

Qi Li, Ph.D. conferred September 2017, Currently Manufacturing Engineer at First Solar.

Shailesh Konda, Ph.D. conferred February 2018, Currently TD Module Engineer at Intel

Liang Qiao, Ph.D. conferred February 2018, Currently Senior Engineer at Petrochemical Research Institute, PetroChina

Parham Rohani, Ph.D. conferred June 2018, Currently CEO of NanoHydroChem, LLC

Yang Liu, Ph.D. conferred September 2018, Currently Professor at Fudan University

Deqiang Yin, Ph.D. conferred September 2018, Currently Senior Scientist at Honeywell

Mohammad Moein Mohammadi Ph.D. conferred September 2020, Currently post-doc at the University of Texas, Austin

Changning Li, Ph.D. (in biomedical engineering) conferred September 2020. Currently post-doc at the University of Washington and PNNL

Zheng Fu, Ph.D. conferred June 2021. Currently at Bluestar (Beijing) Chemical Machinery Co. Ltd.

Mohammad Malekzadeh, Ph.D. conferred September 2021. Currently at Millipore-Sigma

Abhishek Kumar, Ph.D. conferred June 2022. Currently a post-doc at Pacific Northwest National Laboratories.

Camila Sabatini, Ph.D. (in Biomedical Engineering) conferred September 2022. Currently Associate Professor of Restorative Dentistry at UB.

Priyanshu Vishnoi, Ph.D. conferred June 2024, Currently a post-doc at University at Buffalo.

Shema Rachel Abraham, Ph.D. conferred June 2024, Currently at Intel.

Zhen Liu, M.S. conferred September 2000. Currently Associate Principal Scientist at Merck

Vi Dat "Victor" Tu, M.S. conferred September 2001. Currently Environmental Engineer at US EPA.

Carla (Ng) Baumel, M.S. conferred January 2003. Currently Assistant Prof. at University of Pittsburgh.

Juan Carlos Alva Nieta, M.S. conferred June 2003. Currently Global Business Director at Nouryon

Kar-Chan Choong, M.S. conferred September 2003. Currently Consultant at Eli Lily

Ajinkya Dighe, M.S. conferred February 2010. Currently Project Manager at Mott MacDonald

Chen-An (Roger) Tien, M.S. conferred September 2010. Currently Global Commodities Manager at Hewlett-Packard Enterprise

Nithin Ramadurai, M.S. conferred September 2010. Currently Senior Manager, NPD at PDC Brands

Ching-Wen (Ashley) Chang. M.S. conferred February 2011. Currently R&D Engineer at Lightlab Asia/Sweden AB

Pooja (Chakrabarty) Roy, M.S. conferred September 2011. Currently Process Engineer II at Herbalife

Gary Martin, M.S. conferred September, 2011. Currently Project Engineer at Titan LNG

Digvijay Singh Chauhan, M.S. conferred February 2012. Currently Senior Product Manager at Alkegen (formerly Unifrax LLC)

Mark Kaus, M.S. conferred February 2012. Currently Manager, Process Engineering at Azota Ltd.

Krystal Lajoie, M.S. conferred February 2013. Currently Process Manager at Mohawk Industries

Gauri Dilip Patki, M.S. conferred February 2013. Currently Senior Process Engineer, Catalent Pharma Solutions

Vikram Reddy Ardham, M.S. conferred June, 2013, Currently Data Scientist at Noibu (Ottowa, Canada)

Parham Rohani, M.S. conferred September, 2013, Currently CEO at NanoHydroChem, LLC

Di Qi, M.S. conferred June, 2014, currently Product Manager at Pall Corporation.

Changning Li, M.S. conferred June 2014. Currently a post-doc at University of Washington/PNNL

Saurabh Singh, M.S. conferred September 2014. Currently Process Engineer – PVD at ASM Nexx Inc.

Yujie Ke, M.S. conferred June 2015. Currently Scientist at Institute of Materials Research and Engineering (IMRE), A*STAR, Singapore

Christopher Miller, M.S. conferred September 2015. Currently Process Engineer at PG Technologies, LLC

Andrew Mowbray, M.S. conferred September 2015. Currently Owner/Chief Technician at Mowbray Racing Design

Najing Li, M.S. conferred June 2016. Currently at Volkswagen Group, China

Liang Guo, M.S. conferred September 2017. Currently Project Manager, Selen Science and Technology

Zheng Fu, M.S. conferred September 2017. Currently at Bluestar (Beijing) Chemical Machinery Co. Ltd.

Mayuresh Keskar, M.S. conferred June 2018. Currently Principal Process Integration Engineer at ENOVIX Corp.

Santosh Gunturi, M.S. conferred June 2018. Currently Metallurgist at Freeport McMoRan

Ruijuan Yin, M.S. conferred June 2018.

Shikuan Shao, M.S. conferred September 2018. Currently Ph.D. student at University of Central Florida

Naveshkaanth Alexander, M.S. conferred June 2019, currently Associate Materials Engineer at Tesla

Anirudh Raghavan, M.S. conferred June 2019, currently Business Analyst at Vinmar International

Bhoomika Jayesh Sheth, M.S. conferred September 2019, currently at Nelumbo, Inc.

Yi Chen, M.S. conferred February 2020.

Suyash Nagpurkar, M.S. conferred September 2019. Currently Managing Director at Nexus Polychem.

Chintan Shah, M.S. candidate, started September 2018. Currently Battery Engineer at NanoHydroChem, LLC

Shema Rachel Abraham, M.S. conferred September 2020, currently Ph.D. student in chemical engineering at UB.

Sandeep Kumar Dhandapani, M.S. conferred September 2020, currently Ph.D. student in chemistry at UB.

Mihir Shah, M.S. conferred June 2021. Currently R&D Chemist at Air Company

Vishvajeet Mane, M.S. conferred September 2021. Currently Process Engineer at Global Foundries

Khirabdi Mohanty, M.S conferred September 2021. Currently Ph.D. student in chemical engineering at Texas A&M

Satyarit Rao, M.S. conferred September 2021. Currently Research Associate at Apex Systems

Zhengxi Xuan, M.S. conferred September 2021. Currently Ph.D. student in chemical engineering at UB.

Kaiwen Chen, M.S. conferred September 2022. Currently Ph.D. student in chemical engineering at UB.

Disha Ravipati, M.S. conferred February 2023. Currently at Intel.

Aniruddha Dutta, M.S. conferred June 2023. Currently Research and Development Engineering at Arencibia.

Tanmay More, M.S. conferred June 2024. Entering Ph.D. program at the University at Buffalo.

Kan Lang (Sophia) Tung, M.S. conferred June 2024.

Shweta Dani, M.S. conferred June 2024. Currently at Intel.

Biju Mathew, M.Eng. conferred February 2005. Currently Project Engineer at Nestle S.A.

Chin Kok Ooi, M.Eng. conferred February 2005. Currently Project Coordinator at Schlumberger

Rachel Peck, M.Eng. conferred June 2005.

Jeffrey Pierce, M.Eng. conferred June 2005. Currently Senior Project Engineer at Javan Engineering

Kok On Soh, M.Eng. conferred September 2005.

Perry Pacouloute, M.Eng. conferred February 2009. Currently Project Engineer at Praxair

Michelle Ford, M.Eng. conferred February 2014.

Yong Joon Lee, M.Eng. conferred June 2015. Currently Instructor at Texas Tech University

Xiang Gao, M.Eng. conferred September 2015. Currently Business Development Specialist at ExxonMobil

Michael Potter, M.Eng. conferred June 2016. Currently Chemical Engineer at Zodiac Aerospace

Ming Zeng, M.Eng. conferred June 2016.

Xiang Gao, M.Eng. conferred June 2018.

Mai Nitta, M.Eng. conferred June 2022.

Jilun Wei, M.Eng. conferred September 2022.

Current Graduate Students:

Adam Raszewski, Ph.D. candidate, started September 2018

Shuo Liu, Ph.D. candidate, started September 2019

Venoos Amiri Roodan, Ph.D. candidate, started September 2019

Zhengxi Xuan, Ph.D. candidate, started September 2021

Kaiwen Chen, Ph.D. candidate, started September 2022

Mohd Ashjar Khan, Ph.D. candidate, started September 2022

Sadaf Mohsenifard, Ph.D. candidate, started September 2022

Parth Khandagale, Ph.D. candidate, started September 2023

Kamyar Mirzaei, Ph.D. candidate, started January 2024

Tanmay More, Ph.D. candidate, starting September 2024

Manan Jain, M.S. candidate, started September 2022

Om Korade, M.S. candidate, started September 2022

Sharath Krishna Biju, M.S. candidate, started September 2023

Vedika Bhanu Gowda, M.S. candidate, started January 2024

Undergraduate researchers for academic credit or through summer programs: Jasheah Howard, Chidubem Okorozo, Dilakshana Ranjit, Yan Chen, Lakshay Chopra, Shashank Negi, Jacob O'Connor, Zhengxi Xuan, Sushanta Ray, Steven Li, Jimmy Wu, Adam Raszewski, Steven Setang, Fatou Cisse, John Stebbins, Abdul-Malik Davies, Lixiao Xu, Mark Pitman, Enzo Benfanti, Tanahiry Escamilla, Maisa Khaja, Mohammed Zaid, John Ghosen, Charles Darku, Zachary Wong, Kevin Jock, Andrew Craft, Jaehoon Jeong, Mark Falinski, Christopher Spengler, Keira Henry, Christina Olgin, Steven Brown, Daniel Salem, Ashley Narain, Bianca Kirkland, Xinyu Wang, Jordan Angie, Paul Garman, David Ramsammy, Janet Oluwole, Jean Kang, Matthew Hill, Demetra McIlwain, Mohammed Attwa, Ben Afriye, Conor Kilcoyne, Belle Cunningham, Larry Lai, Will van Bramer, Chenxu "Tony" Liu, Kwadjo Asante, Phillip Tucciarone, Nicholas Karker, Michael Demissie, YingYing Kwak, YingHaw Lee, Fenna Wiyasa, Joseph Marchica, Thao Nguyen, Ui Tee Cheah, Jasmine May, Christopher Thomas, Fenna Wiyasa, Daniel DeMonte, Krystal LaJoie, Yudazyco (no surname), Elizabeth Egbetokun, David Galuski, Elizabeth Oluwabunmi, Nikita Petrosyan, Yan Lian Tay, Franklin Yeboah, Brittany Malone, Mary Brummond, Ebun Ayandele, Geraldene Agbasionwe, Carlos Gonzales, Lola Ojurongbe, Sie Siong Wong, Tomiko Stroud, Roshad Coston, Joyce Eleda, Mary Akuamoah-Boateng, Justin Lawliss, Michael Williams, Calvin Setiawan, Mame-efua Afrane, Paul Schneeberger, Mark Rudolph, Misty Pender, Kristen Lane, Folarin Erogbogbo, Brian Peer, Alireza Goodarzi, William Scharmach, Phan Nee Saw, Siew Shee Lim, Ashish Chitalia, Chin Fan Tee, Howard Tan, Siew Chen Mak, Jessica Yee, Christine Balonek, Jeff Pierce, Daniel Kim, Sarah Marshall, Chiemezie Amadi, Thomas Agbanyo, James Tseng, Elijah Kim, and Scott Comstock.

Visiting Researchers:

Amine Ezzahi (Fulbright Scholar), Professor, Université Hassan II de Casablanca, Morocco

Anu Sharma, Ph.D. candidate, University of Delhi

Hongyu Wang, Associate Professor, Nanjing University of Posts and Telecommunications

Peng Li, Ph.D. candidate, Jilin University

Li Zhang, Associate Professor, Nanchang University

Yujuan Cao, Associate Professor, South China Normal University

Hongyan Zou, Assistant Professor, Southwest University

Kejun Tan, Professor, Southwest University

Hui Liu, Assistant Professor, Southwest University

Wenxia Zhao, Assistant Professor, Ningxia Normal University

Yunjun Rui, Associate Professor, Nanjing University of Science and Technology

Lin Tao, Ph.D. student, Nanjing University (currently at Guangxi University)

Charles Darku, undergraduate, Kwame Nkrumah University of Science & Technology, Ghana

Sampa Chakrabarti, Associate Professor, University of Calcutta

Oscar Bomati-Miguel, researcher, University of Aragon (currently Universidad de Cádiz)

Anoop Gupta, Ph.D. student, University of Duisburg-Essen (currently at BASF)

Seiichi Sato, Assistant Professor, Hyogo University

Songbeom Kim, Ph.D. student, KAIST (currently at Kangwon National University)

Adil Mukhtarov, Professor, Institute of Nuclear Physics, Tashkent, Uzbekistan

Polina Tereshchuk, Ph.D. student, Institute of Nuclear Physics, Tashkent, Uzbekistan (currently at Tel Aviv University)

Zakir Khakimov Professor, Institute of Nuclear Physics, Tashkent, Uzbekistan (deceased)

FUNDED RESEARCH AND EDUCATION GRANTS

"Catalytic Membrane Reactors Based on Carbon Molecular Sieve Hollow Fiber Membranes for Sustainable and Modular H_2 Production", co-PI with PI Haiqing Lin and co-PI Carl Lund, DoE-NETL, $1,600,000, 10/01/2022-09/31/2024. Plus $500,000 matching grant from NYSTAR for this project.

"MRI: Acquisition of a High Brilliance Dual-Source X-ray Diffractometer for Advanced Materials Research, Education, and Training in Western New York", one of multiple co-PIs with PI Jason Benedict, NSF, $250,358, 09/01/2022-08/31/2023.

"Bioengineered microbial synthesis of rare-earth containing nanoparticles for photon conversion", co-PI with PI Paras Prasad and co-PI Blaine Pfeifer, DARPA, $1,014,515, 09/02/2022-12/31/2023.

"Comprehensive Minimally/non-invasive Multifaceted Assessment of Nano-/microelectronic Devices (CoMMAND)", one of ~11 senior personnel on project, AFOSR MURI program, $7,500,000, 07/01/2022-06/30/2027.

"PFI-TT: Development of Polymeric Organosilica Membranes for Hydrogen Purification at 100-300°C", co-PI with PI Haiqing Lin, NSF, $249,998, 01/01/21-12/31/22.

"Center for Exascale Simulation of Hybrid Rocket Motors", co-PI with PI Paul Desjardin and James Chan, Abani Patra, Varun Chandola, Matt Jones, and Matt Knepley, DOE/NNSA, $8,530,198 DOE share, $1,059,551 cost-share, $9,589,749 total, 10/01/2020-09/30/2025.

"Development and Demonstration of a Functional and Manufacturable Method for Producing a Satable and Accurate Enzyme-based Ethanol Test Strip", Derma-Tec, LLC, $5705, 01/16/2020-09/30/3030.

"Silicon Anode Development for Li-Ion Batteries", PI, UB Innovation Hub, $62,000, 07/01/2019 – 12/31/2020.

"Polymer-antibiotic Conjugates as Antibacterial Additives for Dental Resins", co-PI with PI Chong Cheng, Camila Sabatini, and Michelle Visser, NIH, $433,995, 07/01/2019-06/30/2021.

"Screen Printing Ethanol Detection Patch," Derma-Tec, LLC, $6,218, 07/01/2019-10/31/2019.

"Scalable and Cost-Effective Roll-To-Roll Additive Manufacturing of Highly Durable and Thermal Insulating Silica-Carbon Aerogel", co-PI with PI Shenqiang Ren and Chi Zhou, $1,500,000, 05/01/2019-04/30/2022.

"Manufacturing USA: GOALI: Designing Catalytic Membrane Reactors (CMRs) for Low Temperature CO_2 Utilization and Methane Dry Reforming", PI with co-PIs Haiqing Lin and Carl Lund, NSF, $360,000, 09/01/2018-08/31/2021.

"Planning Grant: Engineering Research Center for Responsive, Efficient, Livable, and Independent Sunlight-enabled Habitats (RELISH)", PI with co-PIs Martha Bohm, Quanxi Jia, Paras Prasad, and Krishna Rajan, NSF, $100,000, 09/01/2018-08/31/2021.

"Development of Innovative Thermal Conveyor Scaled-Down Prototype for Process Industries", industry collaboration award with S. Howes, LLC, NYSTAR/FuzeHub, $50,000, 08/15/2018-08/15/2019.

"SUNY Center-Scale Proposal Planning and Development Grant to support development of a Center for Photon Conversion Technology", SUNY, $50,000, 07/01/2018-06/30/2020.

"Sorption Enhanced Mixed Matrix Membranes for Hydrogen Purification and Carbon Dioxide Capture", co-PI with PI Haiqing Lin, DOE-NETL, $1,470,099, 10/01/15-12/31/18.

"New York State Center of Excellence in Materials Informatics (nominal PI on economic development award, only a small fraction supports Swihart group activities)" New York State (Empire State Development, via NYSTAR), $3,872,000, 07/01/14-06/30/18

"Flexible Electronics" SUNY Network of Excellence in Materials and Advanced Manufacturing, UB PI, SUNY RF, $60,000 (direct costs, UB share), 04/01/14-06/30/16.

"MRI: Development of an Instrument for Quantitative Characterization of Behavior of Magnetic Particles and Magnetically-Labeled Biomaterials in Emerging Applications," NSF, $764,736 (70% from NSF, 30% UB cost-share), start date 09/01/13, duration 36 months, PI with 3 co-PIs, Swihart share ~25%.

"Bio-nanocombinatorics to Achieve Precisely-Assembled Multicomponent, Functional Hybrid Nanomaterials", AFOSR, $2,875,000, start date 05/01/2012, duration 60 months, co-PI with P.N. Prasad, M.R. Knecht, T. Walsh, and A. Zhang. Swihart share ~20%.

"Study of reaction mechanisms and mass transport phenomena in carbonyl decomposition", Vale-INCO Canada, $225,000 total costs, start date 12/12/2011, duration 36 months. Swihart share = 100%

"Development of Si(Ge) nanoparticles and nano ink for low cost PV application", Korean Institute for Energy Research, $93,018 total costs, start date 07/01/2011, duration 18 months. Swihart share = 100%

"Third-order Nonlinear Optical Organics", AFOSR, $1,297,656 total costs, start date 06/15/2011, duration 36 months, co-PI with P.N. Prasad, Tobin Marks, and John Reynolds. Swihart share, ~25%.

"GOALI: Flame-based Synthesis of Metal Nanoparticles at Millisecond Residence Times", NSF, $278,811 total costs, start date 03/01/2011, duration 36 months. Swihart share = 100%, co-PI Vassilis Papavassiliou from Praxair supported by Praxair cost-share commitment not included in above total costs.

"MRI: Acquisition of a Dual Beam/Focused Ion Beam System for Research and Education", NSF, $1,096,411 total costs, start date 08/01/09, duration 12 months, one of three co-PI's with PI Gottfried Strasser. Swihart share ~20%.

"Development of Bottom-Up Chemical Approaches to 3-D Negative Index Meta-Materials", AFOSR, $1,500,000 total costs, start date 04/01/09, duration 60 months, co-PI with PI Paras N. Prasad and co-PI Edward Furlani. Swihart share ~33%.

"Nanoparticle Synthesis using Thermal Nozzle Technology", Praxair, Inc., $50,000 total costs, start date 03/01/09, duration 9 months. Swihart share = 100%

"Synthesis and Production of Nanoparticles of Cesium Dihydrogen Phosphate", SuperProtonic, Inc., $20,852 total costs, start date 07/01/07, duration 3 months. Swihart share = 100%

"Nonconventional Tight-Binding Molecular Dynamics Simulations of Silicon Nanoparticles: Effect of Shape, Surface Termination, and Defects on Electronic Structure", US co-PI with international co-PI Khakimov Zokirkhon Muydinkhonovich of the Institute of Nuclear Physics, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan, funded by The Civilian Research and Development Foundation, $61,200 direct costs, primarily to support travel of the Uzbek team to UB, start date 06/01/07, duration 24 months. Swihart share = 20%

"Continuous Production of Semiconductor Nanoparticles by Spray Pyrolysis", NSF, $280,089 total costs, start date 03/15/07, duration 36 months. Swihart share = 100%

"Nanoparticle Synthesis using Thermal Nozzle Technology", Praxair, Inc., $69,951 total costs, start date 03/01/07, duration 12 months. Swihart share = 100%

"MRI: Acquisition of an Imaging Time of Flight Secondary Ion Mass Spectrometer (ToF-SIMS)," one of 4 co-PI's with PI Joseph Gardella, NSF, $905,195 total costs, start date 07/01/06, duration 24 months. Swihart share = 20%

"Third International Symposium on Gas-Phase and Surface Chemistry of Vapor Phase Materials Processing", NSF, $4,000, start date: 06/01/06, duration 12 months. Swihart share = 100%

"Porous Polymer Gratings for Sensing Applications", co-PI with PI Alexander Cartwright, UB Foundation, Sterbutzel Research Fund, $80,000 direct costs, start date 06/01/05, duration 24 months. Swihart share = 50%

"Biomedical assays based on zinc selenide and silicon luminescent quantum dots", PI with co-PI's Stelios Andreadis, T.J. Mountziaris, and Eli Ruckenstein, UB Foundation, Sterbutzel Research Fund, $70,000 direct costs, start date 06/01/05, duration 24 months. Swihart share = 25%

"Collaborative Research: Detailed Chemical Kinetic Modeling of the Homogeneous Chemical Nucleation of Nanoparticles", PI, funded by NSF, $79,195 direct costs, $120,000 total costs, start date 04/15/05, duration 36 months. Swihart share = 100% (collaborator funded by separate grant)

"MRI: Acquisition of small/wide angle X-ray scattering system for nanomaterials characterization", one of 4 co-PI's with PI Paschalis Alexandridis, $332,090 direct costs, $360,796 total costs, start date, 08/01/04, duration 24 months. Swihart share = 20%

"Experimental parametric study on the preparation of ultrafine (50 – 200 nm diameter) nickel particles by laser driven decomposition of nickel carbonyl", PI, funded by INCO Technical Services, Ltd. (Toronto, Canada), $13,456 direct costs, $24,843 total costs, start date 12/01/03, duration 5 months. Swihart share = 100%

"Synthesis and Characterization of Tellurite Glass Nanoparticles and Nanocomposites for Photonics Applications", PI, with co-PI James O'Reilly, funded by the UB IRCAF program, $28,000 direct costs, start date 11/01/03, duration 12 months. Swihart share = 50%

"Advanced Nanoparticle Technologies for Novel Photodetectors and Emitters", co-PI with PI Vladimir Mitin and co-PI's Frank Bright and Alexander Cartwright, funded by the UB IRCAF program, $40,000 direct costs, start date 11/01/03, duration 12 months. Swihart share = 25%

"Self-consistent tight-binding molecular dynamics simulation of hydrogenated silicon systems", US co-PI with international co-PI Khakimov Zokirkhon Muydinkhonovich of the Institute of Nuclear Physics, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan, funded by The Civilian Research and Development Foundation, $57,000 direct costs, primarily to support travel of the Uzbek team to UB, start date 11/18/03, duration 24 months. Swihart share = 20%

"REU Site: Transdisciplinary Undergraduate Research Initiative On Nanostructured Semiconductors (TURIONS)", PI, with co-PI Alexander Cartwright; NSF, $272,100 direct costs, $306,000 total costs, start date 03/15/03, duration 36 months. MTS managed 100% of the funds, which supported undergraduate researchers working with 10 faculty.

"Synthesis and Characterization of Magnetic Nanoparticles and Assemblies Thereof", PI, with co-PI's Paras Prasad and Hong Luo, funded by UB IRCAF program, $46,000 direct costs, start date 11/01/02, duration 12 months. Swihart share = 40%

"IGERT Biophotonics: Materials and Applications", one of about 25 faculty participants, funded by NSF, $2,685,476 total costs, start date 09/01, duration 60 months. Swihart share = 5%

"On-Line Measurement of Particles Generated in Polysilicon CVD Reactors", PI, funded by Advanced Silicon Materials, Inc (Moses Lake, WA), $64,139 direct costs, $83,957 total costs, start date 05/01/01, duration 16 months. Swihart share = 100%

"Detailed Chemical Kinetic Modeling of the Homogeneous Chemical Nucleation of Nanoparticles", PI with co-PI Linda Broadbelt of Northwestern University. NSF, $319,825 direct costs, $381,999 total costs, start date 11/15/00, duration 48 months. Swihart share = 50%

"Incorporation of Graphical Programming and Automated Data Acquisition into the Chemical Engineering Undergraduate Laboratories", PI, funded by the University at Buffalo Educational Technology Grants Program, $9,800 direct costs, start date 03/01/99, duration 15 months. Swihart share = 100%